REMARKS

GENERAL OBJECTIONS

The Examiner requires that "Updated PCT Information" be provided at the beginning of the specification. The PCT information was provided in the Preliminary Amendment filed in December 2004, and it was requested that the specification be updated accordingly by the USPTO.

The Examiner objects to the specification as containing unnecessary spaces. These spaces were the result of a printing error on the original document. A new specification is attached herein as **Appendix A**, and the Applicant respectfully requests that the Examiner replace the original specification with this version. There is no new matter added by virtue of this amendment.

Claims 3, 16, 17, 24, 25, 38, 51, 52, 59, 73 and 74 have been reviewed and the term "type" has been deleted.

Claims 11-14, 45-46, 48-49 and 67-70 have been reviewed. Those claims containing the term "about" have been amended to delete that term.

Claim 41 has been amended to correct dependency.

Claims 57, 75 and 76 are correct based on the specification. The "composition" in those claims does comprise a solvent system and surfactant, but the use of the term "polydispersity" is correct in this instance. A declaration from the inventors can be provided, if necessary.

NONSTATUTORY DOUBLE PATENTING

Claims 1-5, 7-17, 26-35, 57-61 and 64-76 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of US Patent 6723780. The Applicant respectfully disagrees, but in the interest of accelerating this case to allowance, a terminal disclaimer addressing this rejection is provided herein.

Claims 1-5, 7-17, 26-35, 57-61 and 64-76 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-12 of US Patent 6506831. The Applicant respectfully disagrees, but in the interest of accelerating this case to allowance, a terminal disclaimer addressing this rejection is provided herein.

Claims 26-40 and 42-56 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of US Patent 6506441. The Applicant respectfully disagrees, but in the interest of accelerating this case to allowance, a terminal disclaimer addressing this rejection is provided herein.

35 USC §§102 AND 103

Claims 1-5, 8-17, 26-29, 32-40, 43-55, 57-62 and 64-76 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Drage (US 5858547).

Claims 1-21, 23-55, 57-62 and 64-76 are rejected under 35 USC 103(a) as obvious over Drage (US 5858547).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Claim 57 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition and wherein the polydispersity of the composition is less than about 2.5."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one

contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Drage teaches an improved method form forming planarization films which remain adhered to substrates upon exposure to heat, wherein a solvent may be added to the planarization film, but the solvent is not required. Drage does not anticipate the claims of the present application because Drage does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, **wherein the solvent system is compatible** with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. There is no choice in Drage of the solvent system in order to a) be compatible with the structural constituent and b) lower at least one of the intermolecular forces or surface forces components of the planarization composition. Note that in Drage, for example, ethyl lactate is cited in a group of solvents as suitable, if not preferred. However, in the present application, it is clear that ethyl lactate is not desirable, based on solubility parameters, intermolecular forces and capillary flow.

It is interesting to note that the Applicants specifically mention this reference in the specification of the current application as to materials that may be utilized in this new type of composition. However, the compositions produced in the immediate reference isn't the same as the current composition, because the solvent system has not been tuned to be compatible with the structural constituent and the planarization composition. This point is made clearer by a review of Example 10 in the current application, where a typical solvent solution is compared with a tuned solvent system, and the tuned solvent system produces dramatically improved results with respect to planarization (reduced viscosity and interfacial surface tension) and maximization of trench fill properties.

Therefore, claims 1, 36 and 57 are allowable as not anticipated and, in the alternative, patentable over Drage. In addition, the remaining dependent claims are allowable as patentable over Drage by virtue of their dependency on independent claims 1, 36 and 57.

Claims 1-5, 7-17, 26-29, 32-40, 42-55, 57-61 and 63-75 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Rahman et al (US 5928836).

Claims 1-55 and 57-75 are rejected under 35 USC 103(a) as obvious over Drage (US 5858547) in view of Rahman et al (US 5928836).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Claim 57 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition and wherein the polydispersity of the composition is less than about 2.5."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the

strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Rahman teaches the synthesis and use of low-molecular weight novolac polymers. Drage teaches an improved method form forming planarization films which remain adhered to substrates upon exposure to heat, wherein a solvent may be added to the planarization film, but the solvent is not required. Rahman, Drage or the combination of the two does not anticipate the claims of the present application because Rahman, Drage or the combination of the two does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, **wherein the solvent system is compatible** with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. There is no choice in Rahman, Drage or the combination of the two of the solvent system in order to a) be compatible with the structural constituent and b) lower at least one of the intermolecular forces or surface forces components of the planarization composition. Note that in Drage, for example, ethyl lactate is cited in a group of solvents as suitable, if not preferred. However, in the present application, it is clear that ethyl lactate is not desirable, based on solubility parameters, intermolecular forces and capillary flow.

It is interesting to note that the Applicants specifically mention both of these references in the specification of the current application as to materials that may be utilized in this new type of composition. However, the compositions produced in the immediate references aren't the same as the current composition, because the solvent system has not been tuned to be compatible with the structural constituent and the planarization composition. This point is made clearer by a review of Example 10 in the current application, where a typical solvent solution is compared with a tuned solvent system, and the tuned solvent system produces dramatically improved results with respect to planarization (reduced viscosity and interfacial surface tension) and maximization of trench fill properties.

Therefore, claims 1, 36 and 57 are allowable as not anticipated and, in the alternative, patentable over Rahman, Drage or the combination of the two references. In addition, the remaining dependent claims are allowable as patentable over Rahman, Drage or the combination of the two references by virtue of their dependency on independent claims 1, 36 and 57.

Claims 1-21, 23-62 and 64-75 are rejected under 35 USC 103(a) as obvious over Drage (US 5858547) in view of McCutcheon et al (US 2007/0105384) or Patil et al. (US 2003/0207209).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Claim 57 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition and wherein the polydispersity of the composition is less than about 2.5."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be

replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Drage teaches an improved method form forming planarization films which remain adhered to substrates upon exposure to heat, wherein a solvent may be added to the planarization film, but the solvent is not required. Drage does not anticipate the claims of the present application because Drage does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, **wherein the solvent system is compatible** with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. There is no choice in Drage of the solvent system in order to a) be compatible with the structural constituent and b) lower at least one of the intermolecular forces or surface forces components of the planarization composition. Note that in Drage, for example, ethyl lactate is cited in a group of solvents as suitable, if not preferred. However, in the present application, it is clear that ethyl lactate is not desirable, based on solubility parameters, intermolecular forces and capillary flow.

It is interesting to note that the Applicants specifically mention this reference in the specification of the current application as to materials that may be utilized in this new type of composition. However, the compositions produced in the immediate reference isn't the

same as the current composition, because the solvent system has not been tuned to be compatible with the structural constituent and the planarization composition. This point is made clearer by a review of Example 10 in the current application, where a typical solvent solution is compared with a tuned solvent system, and the tuned solvent system produces dramatically improved results with respect to planarization (reduced viscosity and interfacial surface tension) and maximization of trench fill properties.

McCutcheon and Patil do not cure the obvious deficiencies of Drage, alone or in combination with each other, since these references refer to UV or visible light curing, and therefore claims 1, 36 and 57 are allowable as not anticipated and, in the alternative, patentable over Drage. In addition, the remaining dependent claims are allowable as patentable over Drage by virtue of their dependency on independent claims 1, 36 and 57.

Claims 1-3, 8-10, 26, 28-29, 32-33, 36-38, 43-44, 47 and 53-55 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Montgomery (US 6258514).

Claims 1-3, 8-14, 26, 28-29, 32-33, 36-38, 43-49 and 53-55 are rejected under 35 USC 103(a) as obvious over Montgomery (US 6258514).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Claim 57 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition and wherein the polydispersity of the composition is less than about 2.5."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the

strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Montgomery teaches an apparatus and method for manufacturing a device using lithography. Montgomery does not anticipate the claims of the present application because Montgomery does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. Note that in the Montgomery reference, the planarization composition described is the "reference composition" referred to in the present application. (See Column 6, lines 43-45 of the Montgomery reference and page 12, lines 4-21 of the present application). Montgomery does not anticipate utilizing an improved "solvent system" such as the one described herein where the strongly hydrogen-bonding solvent (of Montgomery) can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol

possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Therefore, claims 1, 36 and 57 are allowable as patentable over Montgomery. In addition, the remaining dependent claims are allowable as patentable over Montgomery by virtue of their dependency on independent claims 1, 36 and 57.

Claims 1-5, 7-17, 26-29, 32-40 and 42-55 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Rogler (US 5276126).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and

associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Rogler is similar to all of the references cited by the Examiner, but yet does not anticipate or render unpatentable the claims of the present application because Rogler does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. Rogler does not anticipate utilizing an improved "solvent system" such as the one described herein where the strongly hydrogen-bonding solvent (of Rogler) can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Therefore, claims 1 and 36 are allowable as patentable over Rogler. In addition, the remaining dependent claims are allowable as patentable over Rogler by virtue of their dependency on independent claims 1 and 36.

Claims 1-2, 8-14, 26, 28-29, 32-33, 36-37, 43-49 and 53-56 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over McCutcheon et al. (US 2007/0105384).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and

associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

McCutcheon is similar to all of the references cited by the Examiner, but yet does not anticipate or render unpatentable the claims of the present application because McCutcheon does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. McCutcheon does not anticipate utilizing an improved "solvent system" such as the one described herein where the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Therefore, claims 1 and 36 are allowable as patentable over McCutcheon. In addition, the remaining dependent claims are allowable as patentable over McCutcheon by virtue of their dependency on independent claims 1 and 36.

Claims 1-5, 7-17, 26-29, 32-40, 42-55, 57-61 and 63-75 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Hacker et al. (US 6723780, 6506831, 6506441).

Claims 1-17, 26-29, 32-55 and 57-75 are rejected under 35 USC 103(a) as obvious over Hacker et al. (US 6723780, 6506831, 6506441).

Claims 1-55 and 57-75 are rejected under 35 USC 103(a) as obvious over Hacker et al. (US 6723780, 6506831, 6506441) in view of Drage (US 5858547).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Claim 57 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition and wherein the polydispersity of the composition is less than about 2.5."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one

contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Hacker et al teaches a process for forming a planarization film on a substrate that does not spoke or fume on heating. However, Hacker, like Drage, does teach that a surfactant selected from the group consisting of a non-fluorinated hydrocarbon, a fluorinated hydrocarbon and combinations thereof is required. Note that when solvents are utilized in Hacker, those solvents are the same solvents that are found in the "reference composition" of the present application, not the contemplated composition.

It is interesting to note that the Applicants specifically mention this reference in the specification of the current application as to materials that may be utilized in this new type of composition. However, the compositions produced in the immediate reference isn't the same as the current composition, because the solvent system has not been tuned to be compatible with the structural constituent and the planarization composition. This point is made clearer by a review of Example 10 in the current application, where a typical solvent solution is compared with a tuned solvent system, and the tuned solvent system produces

dramatically improved results with respect to planarization (reduced viscosity and interfacial surface tension) and maximization of trench fill properties.

Therefore, claims 1, 36 and 57 are allowable as patentable over Hacker et al, alone or in combination with Drage. In addition, the remaining dependent claims are allowable as patentable over Hacker et al. , alone or in combination with Drage, by virtue of their dependency on independent claims 1, 36 and 57.

Claims 1-3, 8-14, 26, 28-29, 32-33, 36-38, 43-49 and 53-56 are rejected under 35 USC 102(b) as anticipated by or, in the alternative, under 35 USC 103(a) as obvious over Prybyla (US 6048799).

The Applicant respectfully disagrees.

Claim 1 recites: "A planarization composition, comprising: a structural constituent; at least one surfactant; and a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition."

Claim 36 recites: "A method of forming a planarization composition, comprising: providing a structural constituent; providing at least one surfactant; providing a solvent system, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition; and blending the structural constituent, the at least one surfactant and the solvent system to form a planarization composition."

Pages 9-13 of the specification teach what the phrase "solvent system" that is "compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition" means. In one contemplated example involving novolac resins, a strongly hydrogen-bonding solvent is used to dissolve the surfactant that is added to the polymeric solution. In one instance, the strongly hydrogen-bonding solvent is ethyl lactate and the surfactant is a fluoroaliphatic polymeric ester surfactant. For this case, the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and

associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Prybyla is similar to all of the references cited by the Examiner, but yet does not anticipate or render unpatentable the claims of the present application because Prybyla does not teach that a planarization composition can be formed that comprises: a structural constituent; a surfactant and **a solvent system**, wherein the solvent system is compatible with the structural constituent and lowers at least one of the intermolecular forces or surface forces components of the planarization composition. Prybyla does not anticipate utilizing an improved "solvent system" such as the one described herein where the strongly hydrogen-bonding solvent can be replaced by a co-solvent system comprising an alcohol, such as 2-propanol and propylene glycol methyl ether acetate (PGMEA). Utilizing to the Hildebrand and Hansen solubility parameters, it is believed that the solubility of fluoroaliphatic polymeric ester surfactant in 2-propanol is similar to that of PGMEA, however, superior to ethyl lactate. In addition, 2-propanol possesses weaker intermolecular forces and lower surface tension than ethyl lactate. The capillary flow in narrow trenches is affected by the molecular structure and associated electrical charge. Representing integral effects of surface forces, the apparent viscosity of moderately polar 2-propanol decreases from its nominal value at narrow trench regime, where the ratio between apparent and nominal viscosity for ethyl lactate is larger than that of 2-propanol. Addition of PGMEA to 2-propanol in the co-solvent system for the surfactant reduces the evaporation rate difference between 2-propanol and bulk PGMEA used for cresol-novolac resin dilution.

Therefore, claims 1 and 36 are allowable as patentable over Prybyla. In addition, the remaining dependent claims are allowable as patentable over Prybyla by virtue of their dependency on independent claims 1 and 36.

CONCLUSION

The Examiner cites several references that refer to novolac polymers with a solvent or combination of solvents as part of the solution. The Examiner considers these references to render the current claims unpatentable. The Applicant respectfully requests that the Examiner review the current application closely. The Applicants call out the compounds in many of these references as suitable compounds to use, but clearly points out that all of these references are producing compositions that are not the same or superior to the ones produced in the current application.

It's not enough to merely combine solvents with polymers and form a composition. The Applicants suggest that thoughtfully and strategically combining solvents in order to affect properties of the composition and provide many examples of how contemplated compositions are superior to reference compositions for this reason.

The undersigned Attorney-of-Record respectfully requests an interview to resolve any remaining issues the Examiner has after review of this response, in order to avoid additional and lengthy written prosecution. Dr. Thompson is available during the week from 8AM to 4PM PST and can be reached at 949-224-6282.

REQUEST FOR ALLOWANCE

Claims 1-14, 16-49, 51-70 and 72-75 are pending in this application, and the Applicant respectfully requests that the Examiner reconsider the claims in light of the arguments presented and allow all pending claims.

Respectfully submitted,

Buchalter Nemer, A Professional Corp.

Dated: October 16, 2008

By: /Sandra P. Thompson, PhD, Esq.

Reg. No. 46,264
E-mail: sthompson@buchalter.com
Direct Line: 949-224-6282

ATTORNEYS FOR APPLICANT(S):

Buchalter Nemer, A Professional Corporation
18400 Von Karman Ave., Suite 800
Irvine, CA 92612
Fax: 949-224-6203